US006743234B2

(12) **United States Patent**
Burkus et al.

(10) **Patent No.: US 6,743,234 B2**
(45) **Date of Patent: Jun. 1, 2004**

(54) **METHODS AND INSTRUMENTATION FOR VERTEBRAL INTERBODY FUSION**

(75) Inventors: **J. Kenneth Burkus**, Columbus, GA (US); **Eddie F. Ray, III**, Collierville, TN (US); **James P. Duncan**, Southaven, MS (US)

(73) Assignee: **SDGI Holdings, Inc.**, Wilmington, DE (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 144 days.

(21) Appl. No.: **09/965,018**

(22) Filed: **Sep. 27, 2001**

(65) **Prior Publication Data**

US 2002/0068936 A1 Jun. 6, 2002

Related U.S. Application Data

(63) Continuation-in-part of application No. 09/756,492, filed on Jan. 8, 2001, now Pat. No. 6,648,895, which is a continuation-in-part of application No. 09/498,426, filed on Feb. 4, 2000, now Pat. No. 6,575,981.

(60) Provisional application No. 60/118,793, filed on Feb. 4, 1999.

(51) **Int. Cl.**[7] **A61B 17/58**

(52) **U.S. Cl.** **606/90**

(58) **Field of Search** 606/90, 105, 86; 623/17.11, 17.12, 17.13, 17.14, 17.15, 17.16

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,015,255	A	5/1991	Kuslich
5,055,104	A	10/1991	Ray
5,431,658	A	7/1995	Moskovich

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

EP	0 732 093 A2	2/1996
EP	0 880 938 A1	12/1998
WO	WO 93/14801	8/1993
WO	WO 96/27345	9/1996
WO	WO 96/40020	12/1996

(List continued on next page.)

OTHER PUBLICATIONS

Surgical Technique Using Bone Dowel Instrumentation for Anterior Approach, Sofamor Danek The Spine Specialist, 1996.

Reduced Profile Instrumentation Surgical Technique, as described by J. Kenneth Burkus and John D. Dorchak, M.D.; Sofamor Danek, ©1999.

Anterior Instrumentation Surgical Technique, as described by Scott H. Kitchel, M.D.; Sofamor Danek, ©1999.

Lumbar Tapered Fusion Device Surgical Technique, as described by Thomas A. Zdeblick and J. Kenneth Burkus, Sofamor Danek, ©2000.

Primary Examiner—Eduardo C. Robert
(74) *Attorney, Agent, or Firm*—Woodard, Emhardt, Moriarty, McNett & Henry LLP

(57) **ABSTRACT**

Methods and instrumentation particularly adapted for disc space preparation for insertion of implants from an anterior approach to the spine are provided. The instruments include a guide sleeve defining a channel having overlapping cylindrical working channel portions and lateral non-distracting extensions extending from reduced thickness wall portions. The guide sleeve has an overall reduced width configuration. A pair of distractors are provided. A first distractor includes a shaft and distal tip, and the second distractor includes a shaft and distal tip. The first and second distractors can be used with the guide sleeve. Methods using the disclosed instruments are also provided.

19 Claims, 41 Drawing Sheets